

(3) Quantities of licensed material requiring labeling. The following tables contain quantities† of licensed material requiring labeling:

| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|---------------|--------------------------|---------------|--------------------------|
| Hydrogen-3 | 1,000 | Vanadium 47 | 1,000 |
| Beryllium-7 | 1,000 | Vanadium-48 | 100 |
| Beryllium-10 | 1 | Vanadium-49 | 1,000 |
| Carbon-11 | 1,000 | Chromium-48 | 1,000 |
| Carbon-14 | 1,000 | Chromium-49 | 1,000 |
| Fluorine-18 | 1,000 | Chromium-51 | 1,000 |
| Sodium-22 | 10 | Manganese-51 | 1,000 |
| Sodium-24 | 100 | Manganese-52m | 1,000 |
| Magnesium-28 | 100 | Manganese-52 | 100 |
| Aluminum-26 | 10 | Manganese-53 | 1,000 |
| Silicon-31 | 1,000 | Manganese-54 | 100 |
| Silicon-32 | 1 | Manganese-56 | 1,000 |
| Phosphorus-32 | 10 | Iron-52 | 100 |
| Phosphorus-33 | 100 | Iron-55 | 100 |
| Sulfur-35 | 100 | Iron-59 | 10 |
| Chlorine-36 | 10 | Iron-60 | 1 |
| Chlorine-38 | 1,000 | Cobalt-55 | 100 |
| Chlorine-39 | 1,000 | Cobalt-56 | 10 |
| Argon-39 | 1,000 | Cobalt-57 | 100 |
| Argon-41 | 1,000 | Cobalt-58m | 1,000 |
| Potassium-40 | 100 | Cobalt-58 | 100 |
| Potassium-42 | 1,000 | Cobalt-60m | 1,000 |
| Potassium-43 | 1,000 | Cobalt-60 | 1 |
| Potassium-44 | 1,000 | Cobalt-61 | 1,000 |
| Potassium-45 | 1,000 | Cobalt-62m | 1,000 |
| Calcium-41 | 100 | Nickel-56 | 100 |
| Calcium-45 | 100 | Nickel-57 | 100 |
| Calcium-47 | 100 | Nickel-59 | 100 |
| Scandium-43 | 1,000 | Nickel-63 | 100 |
| Scandium-44m | 100 | Nickel-65 | 1,000 |
| Scandium-44 | 100 | Nickel-66 | 10 |
| Scandium-46 | 10 | Copper-60 | 1,000 |
| Scandium-47 | 100 | Copper-61 | 1,000 |
| Scandium-48 | 100 | Copper-64 | 1,000 |
| Scandium-49 | 1,000 | Copper-67 | 1,000 |
| Titanium-44 | 1 | Zinc-62 | 100 |
| Titanium-45 | 1,000 | Zinc-63 | 1,000 |

* To convert microcurie (μ Ci) to kilobecquerel, multiply the microcurie value by 37.

| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|--------------|--------------------------|---------------|--------------------------|
| Zinc-65 | 10 | Bromine-74m | 1,000 |
| Zinc-69m | 100 | Bromine-74 | 1,000 |
| Zinc-69 | 1,000 | Bromine-75 | 1,000 |
| Zinc-71m | 1,000 | Bromine-76 | 100 |
| Zinc-72 | 100 | Bromine-77 | 1,000 |
| Gallium-65 | 1,000 | Bromine-80m | 1,000 |
| Gallium-66 | 100 | Bromine-80 | 1,000 |
| Gallium-67 | 1,000 | Bromine-82 | 100 |
| Gallium-68 | 1,000 | Bromine-83 | 1,000 |
| Gallium-70 | 1,000 | Bromine-84 | 1,000 |
| Gallium-72 | 100 | Krypton-74 | 1,000 |
| Gallium-73 | 1,000 | Krypton-85 | 1,000 |
| Germanium-66 | 1,000 | Krypton-87 | 1,000 |
| Germanium-67 | 1,000 | Krypton-88 | 1,000 |
| Germanium-68 | 10 | Rubidium-79 | 1,000 |
| Germanium-69 | 1,000 | Rubidium-81m | 1,000 |
| Germanium-71 | 1,000 | Rubidium-81 | 1,000 |
| Germanium-75 | 1,000 | Rubidium-82m | 1,000 |
| Germanium-77 | 1,000 | Rubidium-83 | 100 |
| Germanium-78 | 1,000 | Rubidium-84 | 100 |
| Arsenic-69 | 1,000 | Rubidium-86 | 100 |
| Arsenic-70 | 1,000 | Rubidium-87 | 100 |
| Arsenic-71 | 100 | Rubidium-88 | 1,000 |
| Arsenic-72 | 100 | Rubidium-89 | 1,000 |
| Arsenic-73 | 100 | Strontium-80 | 100 |
| Arsenic-74 | 100 | Strontium-81 | 1,000 |
| Arsenic-76 | 100 | Strontium-83 | 100 |
| Arsenic-77 | 100 | Strontium-85m | 1,000 |
| Arsenic-78 | 1,000 | Strontium-85 | 100 |
| Selenium-70 | 1,000 | Strontium-87m | 1,000 |
| Selenium-73m | 1,000 | Strontium-89 | 10 |
| Selenium-73 | 100 | Strontium-90 | 0.1 |
| Selenium-75 | 100 | Strontium-91 | 100 |
| Selenium-79 | 100 | Strontium-92 | 100 |
| Selenium-81m | 1,000 | Yttrium-86m | 1,000 |
| Selenium-81 | 1,000 | Yttrium-86 | 100 |
| Selenium-83 | 1,000 | Yttrium-87 | 100 |

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| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|----------------|--------------------------|-------------------------|--------------------------|
| Yttrium-88 | 10 | Technitium-96m | 1,000 |
| Yttrium-90m | 1,000 | Technitium-96 | 100 |
| Yttrium-90 | 10 | Technitium-97m | 100 |
| Yttrium-91m | 1,000 | Technitium-97 | 1,000 |
| Yttrium-91 | 10 | Technitium-98 | 10 |
| Yttrium-92 | 100 | Technitium-99m | 1,000 |
| Yttrium-93 | 100 | Technitium-99 | 100 |
| Yttrium-94 | 1,000 | Technitium-101 | 1,000 |
| Yttrium-95 | 1,000 | Technitium-104 | 1,000 |
| Zirconium-86 | 100 | Ruthenium-94 | 1,000 |
| Zirconium-88 | 10 | Ruthenium-97 | 1,000 |
| Zirconium-89 | 100 | Ruthenium-103 | 100 |
| Zirconium-93 | 1 | Ruthenium-105 | 1,000 |
| Zirconium-95 | 10 | Ruthenium-106 | 1 |
| Zirconium-97 | 100 | Rhodium-99m | 1,000 |
| Niobium-88 | 1,000 | Rhodium-99 | 100 |
| Krypton-76 | 1,000 | Rhodium-100 | 100 |
| Krypton-77 | 1,000 | Rhodium-101m | 1,000 |
| Krypton-79 | 1,000 | Rhodium-101 | 10 |
| Krypton-81 | 1,000 | Rhodium-102m | 10 |
| Krypton-83m | 1,000 | Rhodium-102 | 10 |
| Krypton-85m | 1,000 | Niobium-89 (66 min) | 1,000 |
| Niobium-94 | 1 | Niobium-89 (122 min) | 1,000 |
| Niobium-95m | 100 | Niobium-90 | 100 |
| Niobium-85 | 100 | Niobium-93m | 10 |
| Niobium-96 | 100 | Silver-104 | 1,000 |
| Niobium-97 | 1,000 | Silver-105 | 100 |
| Niobium-98 | 1,000 | Silver-106m | 100 |
| Molybdenum-90 | 100 | Silver-106 | 1,000 |
| Molybdenum-93m | 100 | Silver-108m | 1 |
| Molybdenum-93 | 10 | Silver-110m | 10 |
| Molybdenum-99 | 100 | Silver-111 | 100 |
| Molybdenum-101 | 1,000 | Silver-112 | 100 |
| Technitium-93m | 1,000 | Silver-115 | 1,000 |
| Technitium-93 | 1,000 | Cadmium-104 | 1,000 |
| Technitium-94m | 1,000 | | |
| Technitium-94 | 1,000 | | |

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| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|---------------|--------------------------|----------------|--------------------------|
| Cadmium-107 | 1,000 | Silver-104m | 1,000 |
| Cadmium-109 | 1 | Antimony-116 | 1,000 |
| Cadmium-113m | 0.1 | Antimony-117 | 1,000 |
| Cadmium-113 | 100 | Antimony-118m | 1,000 |
| Cadmium-115m | 10 | Antimony-119 | 1,000 |
| Cadmium-115 | 100 | Antimony-120 | |
| Cadmium-117m | 1,000 | (16m) | 1,000 |
| Cadmium-117 | 1,000 | Antimony-120 | |
| Indium-109 | 1,000 | (5.76d) | 100 |
| Indium-110m | | Antimony-122 | 100 |
| (69.1m) | 1,000 | Antimony-124m | 1,000 |
| Indium-110m | | Antimony-124 | 10 |
| (4.9h) | 1,000 | Antimony-125 | 100 |
| Indium-111 | 100 | Antimony-126m | 1,000 |
| Indium-112 | 1,000 | Antimony-126 | 100 |
| Indium-113m | 1,000 | Antimony-127 | 100 |
| Indium-114m | 10 | Antimony-128 | |
| Indium-115m | 1,000 | (10.4m) | 1,000 |
| Indium-115 | 100 | Antimony-128 | |
| Indium-116m | 1,000 | (9.01h) | 100 |
| Indium-117m | 1,000 | Antimony-129 | 100 |
| Indium-117 | 1,000 | Antimony-130 | 1,000 |
| Indium-119m | 1,000 | Antimony-131 | 1,000 |
| Tin-110 | 100 | Tellurium-116 | 1,000 |
| Tin-111 | 1,000 | Tellurium-121m | 10 |
| Tin-113 | 100 | Tellurium-121 | 100 |
| Rhodium-103m | 1,000 | Tellurium-123m | 10 |
| Rhodium-105 | 100 | Tellurium-123 | 100 |
| Rhodium-106m | 1,000 | Tellurium-125m | 10 |
| Rhodium-107 | 1,000 | Tellurium-127m | 10 |
| Palladium-100 | 100 | Tellurium-127 | 1,000 |
| Palladium-101 | 1,000 | Tellurium-129m | 10 |
| Palladium-103 | 100 | Tin-117m | 100 |
| Palladium-107 | 10 | Tin-119m | 100 |
| Palladium-109 | 100 | Tin-121m | 100 |
| Silver-102 | 1,000 | Tin-121 | 1,000 |
| Silver-103 | 1,000 | Tin-123m | 1,000 |

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|---------------|--------------------------|-------------------|--------------------------|
| Tin-123 | 10 | Cesium-137 | 10 |
| Tin-125 | 10 | Tellurium-129 | 1,000 |
| Tin-126 | 10 | Tellurium-131m | 10 |
| Tin-127 | 1,000 | Tellurium-131 | 100 |
| Tin-128 | 1,000 | Tellurium-132 | 10 |
| Antimony-115 | 1,000 | Tellurium-133m | 100 |
| Antimony-116m | 1,000 | Tellurium-133 | 1,000 |
| Iodine-131 | 1 | Tellurium-134 | 1,000 |
| Iodine-132m | 100 | Iodine-120m | 1,000 |
| Iodine-132 | 100 | Iodine-120 | 100 |
| Iodine-133 | 10 | Iodine-121 | 1,000 |
| Iodine-134 | 1,000 | Iodine-123 | 100 |
| Iodine-135 | 100 | Iodine-124 | 10 |
| Xenon-120 | 1,000 | Iodine-125 | 1 |
| Xenon-121 | 1,000 | Iodine-126 | 1 |
| Xenon-122 | 1,000 | Iodine-128 | 1,000 |
| Xenon-123 | 1,000 | Iodine-129 | 1 |
| Xenon-125 | 1,000 | Iodine-130 | 10 |
| Xenon-127 | 1,000 | Lanthanum-140 | 100 |
| Xenon-129m | 1,000 | Lanthanum-141 | 100 |
| Xenon-131m | 1,000 | Lanthanum-142 | 1,000 |
| Xenon-133m | 1,000 | Lanthanum-143 | 1,000 |
| Xenon-133 | 1,000 | Cerium-134 | 100 |
| Xenon-135m | 1,000 | Cerium-135 | 100 |
| Xenon-135 | 1,000 | Cerium-137m | 100 |
| Xenon-138 | 1,000 | Cerium-137 | 1,000 |
| Cesium-125 | 1,000 | Cerium-139 | 100 |
| Cesium-127 | 1,000 | Cerium-141 | 100 |
| Cesium-129 | 1,000 | Cerium-143 | 100 |
| Cesium-130 | 1,000 | Cerium-144 | 1 |
| Cesium-131 | 1,000 | Praseodymium-136 | 1,000 |
| Cesium-132 | 100 | Praseodymium-137 | 1,000 |
| Cesium-134m | 1,000 | Praseodymium-138m | 1,000 |
| Cesium-134 | 10 | Praseodymium-139 | 1,000 |
| Cesium-135m | 1,000 | Praseodymium-142m | 1,000 |
| Cesium-135 | 100 | Praseodymium-142 | 100 |
| Cesium-136 | 10 | Praseodymium-143 | 100 |

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|------------------|--------------------------|-----------------|--------------------------|
| Praseodymium-144 | 1,000 | Europium-152 | 1 |
| Praseodymium-145 | 100 | Europium-154 | 1 |
| Praseodymium-147 | 1,000 | Europium-155 | 10 |
| Neodymium-136 | 1,000 | Europium-156 | 100 |
| Neodymium-138 | 100 | Europium-157 | 100 |
| Neodymium-139m | 1,000 | Europium-158 | 1,000 |
| Neodymium-139 | 1,000 | Gadolinium-145 | 1,000 |
| Cesium-138 | 1,000 | Gadolinium-146 | 10 |
| Barium-126 | 1,000 | Gadolinium-147 | 100 |
| Barium-128 | 100 | Gadolinium-148 | 0.001 |
| Barium-131m | 1,000 | Gadolinium-149 | 100 |
| Barium-131 | 100 | Gadolinium-151 | 10 |
| Barium-133m | 100 | Gadolinium-152 | 100 |
| Barium-133 | 100 | Neodymium-141 | 1,000 |
| Barium-135m | 100 | Neodymium-147 | 100 |
| Barium-139 | 1,000 | Neodymium-149 | 1,000 |
| Barium-140 | 100 | Neodymium-151 | 1,000 |
| Barium-141 | 1,000 | Promethium-141 | 1,000 |
| Barium-142 | 1,000 | Promethium-143 | 100 |
| Lanthanum-131 | 1,000 | Promethium-144 | 10 |
| Lanthanum-132 | 100 | Promethium-145 | 10 |
| Lanthanum-135 | 1,000 | Promethium-146 | 1 |
| Lanthanum-137 | 10 | Promethium-147 | 10 |
| Lanthanum-138 | 100 | Promethium-148m | 10 |
| Samarium-153 | 100 | Promethium-148 | 10 |
| Samarium-155 | 1,000 | Promethium-149 | 100 |
| Samarium-156 | 1,000 | Promethium-150 | 1,000 |
| Europium-145 | 100 | Promethium-151 | 100 |
| Europium-146 | 100 | Samarium-141m | 1,000 |
| Europium-147 | 100 | Samarium-141 | 1,000 |
| Europium-148 | 10 | Samarium-142 | 1,000 |
| Europium-149 | 100 | Samarium-145 | 100 |
| Europium-150 | | Samarium-146 | 1 |
| (12.62h) | 100 | Samarium-147 | 100 |
| Europium-150 | | Samarium-151 | 10 |
| (34.2y) | 1 | Dysprosium-166 | 100 |
| Europium-152m | 100 | Holmium-1155 | 1,000 |

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| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|-------------------------|--------------------------|----------------|--------------------------|
| Holmium-157 | 1,000 | Dysprosium-155 | 1,000 |
| Holmium-159 | 1,000 | Dysprosium-157 | 1,000 |
| Holmium-161 | 1,000 | Dysprosium-159 | 100 |
| Holmium-162m | 1,000 | Dysprosium-165 | 1,000 |
| Holmium-162 | 1,000 | Hafnium-173 | 1,000 |
| Holmium-164m | 1,000 | Hafnium-175 | 100 |
| Holmium-164 | 1,000 | Hafnium-177m | 1,000 |
| Holmium-166m | 1 | Hafnium-178m | 0.1 |
| Holmium-166 | 100 | Hafnium-179m | 10 |
| Holmium-167 | 1,000 | Hafnium-180m | 1,000 |
| Erbium-161 | 1,000 | Hafnium-181 | 10 |
| Erbium-165 | 1,000 | Hafnium-182m | 1,000 |
| Erbium-169 | 100 | Hafnium-182 | 0.1 |
| Erbium-171 | 100 | Hafnium-183 | 1,000 |
| Erbium-172 | 100 | Hafnium-184 | 100 |
| Thulium-162 | 1,000 | Tantalum-172 | 1,000 |
| Thulium-166 | 100 | Tantalum-173 | 1,000 |
| Thulium-167 | 100 | Tantalum-174 | 1,000 |
| Thulium-170 | 10 | Tantalum-175 | 1,000 |
| Gadolinium-153 | 10 | Tantalum-176 | 100 |
| Gadolinium-159 | 100 | Tantalum-177 | 1,000 |
| Terbium-147 | 1,000 | Tantalum-178 | 1,000 |
| Terbium-149 | 100 | Tantalum-179 | 100 |
| Terbium-150 | 1,000 | Tantalum-180m | 1,000 |
| Terbium-151 | 100 | Tantalum-180 | 100 |
| Terbium-153 | 1,000 | Thulium-171 | 10 |
| Terbium-154 | 100 | Thulium-172 | 100 |
| Terbium-155 | 1,000 | Thulium-173 | 100 |
| Terbium-156m (5.0h) | 1,000 | Thulium-175 | 1,000 |
| Terbium-156m (24.4h) | 1,000 | Ytterbium-162 | 1,000 |
| Terbium-156 | 100 | Ytterbium-166 | 100 |
| Terbium-157 | 10 | Ytterbium-167 | 1,000 |
| Terbium-158 | 1 | Ytterbium-169 | 100 |
| Terbium-160 | 10 | Ytterbium-175 | 100 |
| Terbium-161 | 100 | Ytterbium-177 | 1,000 |
| | | Ytterbium-178 | 1,000 |
| | | Lutetium-169 | 100 |

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| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|---------------|--------------------------|---------------|--------------------------|
| Lutetium-170 | 100 | Tungsten-176 | 1,000 |
| Lutetium-171 | 100 | Tungsten-177 | 1,000 |
| Lutetium-172 | 100 | Tungsten-178 | 1,000 |
| Lutetium-173 | 10 | Tungsten-179 | 1,000 |
| Lutetium-174m | 10 | Tungsten-181 | 1,000 |
| Lutetium-174 | 10 | Tungsten-185 | 100 |
| Lutetium-176m | 1,000 | Tungsten-187 | 100 |
| Lutetium-176 | 100 | Tungsten-188 | 10 |
| Lutetium-177m | 10 | Rhenium-177 | 1,000 |
| Lutetium-177 | 100 | Rhenium-178 | 1,000 |
| Lutetium-178m | 1,000 | Rhenium-181 | 1,000 |
| Lutetium-178 | 1,000 | Rhenium-182 | |
| Lutetium-179 | 1,000 | (12.7h) | 1,000 |
| Hafnium-170 | 100 | Rhenium-182 | |
| Hafnium-172 | 1 | (64.0h) | 100 |
| Rhenium-188 | 100 | Rhenium-184m | 10 |
| Rhenium-189 | 100 | Rhenium-184 | 100 |
| Osmium-180 | 1,000 | Rhenium-186m | 10 |
| Osmium-181 | 1,000 | Rhenium-186 | 100 |
| Osmium-182 | 100 | Rhenium-187 | 1,000 |
| Osmium-185 | 100 | Rhenium-188m | 1,000 |
| Osmium-189m | 1,000 | Mercury-194 | 1 |
| Osmium-191m | 1,000 | Mercury-195m | 100 |
| Osmium-191 | 100 | Mercury-195 | 1,000 |
| Osmium-193 | 100 | Mercury-197m | 100 |
| Osmium-194 | 100 | Mercury-197 | 1,000 |
| Iridium-182 | 1,000 | Mercury-199m | 1,000 |
| Iridium-184 | 1,000 | Mercury-203 | 100 |
| Iridium-185 | 1,000 | Thallium-194m | 1,000 |
| Iridium-186 | 100 | Thallium-194 | 1,000 |
| Iridium-187 | 1,000 | Thallium-195 | 1,000 |
| Tantalum-182m | 1,000 | Thallium-197 | 1,000 |
| Tantalum-182 | 10 | Thallium-198m | 1,000 |
| Tantalum-183 | 100 | Thallium-198 | 1,000 |
| Tantalum-184 | 100 | Thallium-199 | 1,000 |
| Tantalum-185 | 1,000 | Thallium-200 | 1,000 |
| Tantalum-186 | 1,000 | Thallium-201 | 1,000 |

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|---------------|--------------------------|--------------|--------------------------|
| Iridium-188 | 100 | Francium-223 | 100 |
| Iridium-189 | 100 | Radium-223 | 0.1 |
| Iridium-190m | 1,000 | Radium-224 | 0.1 |
| Iridium-190 | 100 | Radium-225 | 0.1 |
| Iridium-192m | 1 | Radium-226 | 0.1 |
| Iridium-192 | 10 | Radium-227 | 1,000 |
| Iridium-194m | 10 | Thallium-202 | 100 |
| Iridium-194 | 100 | Thallium-204 | 100 |
| Iridium-195m | 1,000 | Lead-195m | 1,000 |
| Iridium-195 | 1,000 | Lead-198 | 1,000 |
| Platinum-186 | 1,000 | Lead-199 | 1,000 |
| Platinum-188 | 100 | Lead-200 | 100 |
| Platinum-189 | 1,000 | Lead-201 | 1,000 |
| Platinum-191 | 100 | Lead-202m | 1,000 |
| Platinum-193m | 100 | Lead-202 | 10 |
| Platinum-193 | 1,000 | Lead-203 | 1,000 |
| Platinum-195m | 100 | Lead-205 | 100 |
| Platinum-197m | 1,000 | Lead-209 | 1,000 |
| Platinum-197 | 100 | Lead-210 | 0.01 |
| Platinum-199 | 1,000 | Lead-211 | 100 |
| Platinum-200 | 100 | Lead-212 | 1 |
| Gold-193 | 1,000 | Lead-214 | 100 |
| Gold-194 | 100 | Bismuth-200 | 1,000 |
| Gold-195 | 10 | Bismuth-201 | 1,000 |
| Gold-198m | 100 | Bismuth-202 | 1,000 |
| Gold-198 | 100 | Bismuth-203 | 100 |
| Gold-199 | 100 | Bismuth-205 | 100 |
| Gold-200m | 100 | Bismuth-206 | 100 |
| Gold-200 | 1,000 | Bismuth-207 | 10 |
| Gold-201 | 1,000 | Bismuth-210m | 0.1 |
| Mercury-193m | 100 | Bismuth-210 | 1 |
| Mercury-193 | 1,000 | Bismuth-212 | 10 |
| Astatine-207 | 100 | Bismuth-213 | 10 |
| Astatine-211 | 10 | Bismuth-214 | 100 |
| Radon-220 | 1 | Polonium-203 | 1,000 |
| Radon-222 | 1 | Polonium-205 | 1,000 |
| Francium-222 | 100 | Polonium-207 | 1,000 |

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|------------------|--------------------------|-----------------|--------------------------|
| Polonium-210 | 0.1 | Uranium-233 | 0.001 |
| Neptunium-234 | 100 | Uranium-234 | 0.001 |
| Neptunium-235 | 100 | Uranium-235 | 0.001 |
| Neptunium-236 | | Uranium-236 | 0.001 |
| (1.15x10y) | 0.001 | Uranium-237 | 100 |
| Neptunium-236 | | Uranium-238 | 100 |
| (22.5h) | 1 | Uranium-239 | 1,000 |
| Neptunium-237 | 0.001 | Uranium-240 | 100 |
| Neptunium-238 | 10 | Uranium-natural | 100 |
| Neptunium-239 | 100 | Neptunium-232 | 100 |
| Neptunium-240 | 1,000 | Neptunium-233 | 1,000 |
| Plutonium-234 | 10 | Berkelium-246 | 100 |
| Radium-228 | 0.1 | Berkelium-247 | 0.001 |
| Actinium-224 | 1 | Berkelium-249 | 0.1 |
| Actinium-225 | 0.01 | Berkelium-250 | 10 |
| Actinium-226 | 0.1 | Californium-244 | 100 |
| Actinium-227 | 0.001 | Californium-246 | 1 |
| Actinium-228 | 1 | Californium-248 | 0.01 |
| Thorium-226 | 10 | Plutonium-235 | 1,000 |
| Thorium-227 | 0.01 | Plutonium-236 | 0.001 |
| Thorium-228 | 0.001 | Plutonium-237 | 100 |
| Thorium-229 | 0.001 | Plutonium-238 | 0.001 |
| Thorium-230 | 0.001 | Plutonium-239 | 0.001 |
| Thorium-231 | 100 | Plutonium-240 | 0.001 |
| Thorium-232 | 100 | Plutonium-241 | 0.01 |
| Thorium-234 | 10 | Plutonium-242 | 0.001 |
| Thorium-natural | 100 | Plutonium-243 | 1,000 |
| Protactinium-227 | 10 | Plutonium-244 | 0.001 |
| Protactinium-228 | 1 | Plutonium-245 | 100 |
| Protactinium-230 | 0.1 | Americium-237 | 1,000 |
| Protactinium-231 | 0.001 | Americium-238 | 100 |
| Protactinium-232 | 1 | Americium-239 | 1,000 |
| Protactinium-233 | 100 | Americium-240 | 100 |
| Protactinium-234 | 100 | Americium-241 | 0.001 |
| Uranium-230 | 0.01 | Americium-242m | 0.001 |
| Uranium-231 | 100 | Americium-242 | 10 |
| Uranium-232 | 0.001 | Americium-243 | 0.001 |

* To convert microcurie (μ Ci) to kilobecquerel, multiply the microcurie value by 37.

| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|--|--------------------------|---|--------------------------|
| Americium-244m | 100 | Einsteinium-251 | 100 |
| Americium-244 | 10 | Einsteinium-253 | 0.1 |
| Americium-245 | 1,000 | Einsteinium-254m | 1 |
| Americium-246m | 1,000 | Einsteinium-254 | 0.01 |
| Americium-246 | 1,000 | Fermium-252 | 1 |
| Curium-238 | 100 | Fermium-253 | 1 |
| Curium-240 | 0.1 | Californium-249 | 0.001 |
| Curium-241 | 1 | Californium-250 | 0.001 |
| Curium-242 | 0.01 | Californium-251 | 0.001 |
| Curium-243 | 0.001 | Californium-252 | 0.001 |
| Curium-244 | 0.001 | Californium-253 | 0.1 |
| Curium-245 | 0.001 | Californium-254 | 0.001 |
| Curium-246 | 0.001 | Fermium-254 | 10 |
| Curium-247 | 0.001 | Fermium-255 | 1 |
| Curium-248 | 0.001 | Fermium-257 | 0.01 |
| Curium-249 | 1,000 | Mendelevium-257 | 10 |
| Berkelium-245 | 100 | Mendelevium-258 | 0.01 |
| Einsteinium-250 | 100 | | |
| Any alpha-emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition | 0.001 | Any radionuclide other than alpha- emitting radionuclides not listed above, or mixtures of beta emitters of unknown composition | 0.01 |

* To convert microcurie (μ Ci) to kilobecquerel, multiply the microcurie value by 37.

NOTE: For purposes of subsections (aa)(5), (dd)(1), and (ww)(1) of this subsection where there is involved a combination of radionuclides in known amounts, the limit for the combination should be derived as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific radionuclide when not in combination. The sum of such ratios for all radionuclides in the combination may not exceed "1" -- that is, unity.

†The quantities listed above were derived by taking 1/10th of the most restrictive ALI listed in Columns 1 and 2 of Table I of subsection (ggg)(2) of this section, rounding to the nearest factor of 10, and constraining the values listed between 0.001 and 1,000 microcuries (37 becquerels and 37 megabecquerels). Values of 100 microcuries (3.7 megabecquerels) have been assigned for radionuclides having a radioactive half-life in excess of E+9 years, except rhenium, 1,000 microcuries (37 megabecquerels), to take into account their low specific activity.

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§289.202(ggg)(4)

(4) Classification and characteristics of low-level radioactive waste (LLRW).

(A) Classification of radioactive waste for land disposal.

(i) Considerations. Determination of the classification of LLRW involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

(ii) Classes of waste.

(I) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in subparagraph (B)(i) of this paragraph. If Class A waste also meets the stability requirements set forth in subparagraph (B)(ii) of this paragraph, it is not necessary to segregate the waste for disposal.

(II) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in subparagraph (B) of this paragraph.

(III) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in subparagraph (B) of this paragraph.

(iii) Classification determined by long-lived radionuclides. If the radioactive waste contains only radionuclides listed in subclause (V) of this clause, classification shall be determined as follows.

(I) If the concentration does not exceed 0.1 times the value in subclause (V) of this clause, the waste is Class A.

(II) If the concentration exceeds 0.1 times the value in Table I, but does not exceed the value in subclause (V) of this clause, the waste is Class C.

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(III) If the concentration exceeds the value in subclause (V) of this clause, the waste is not generally acceptable for land disposal.

(IV) For wastes containing mixtures of radionuclides listed in subclause (V) of this clause, the total concentration shall be determined by the sum of fractions rule described in clause (vii) of this subparagraph.

(V) Classification table for long-lived radionuclides.

| Concentration Radionuclide | curie/cubic meter* | nanocurie/gram** |
|---|--------------------|------------------|
| C-14 | 8 | |
| C-14 in activated metal | 80 | |
| Ni-59 in activated metal | 220 | |
| Nb-94 in activated metal | 0.2 | |
| Tc-99 | 3 | |
| I-129 | 0.08 | |
| Alpha emitting transuranic radionuclides with half- life greater than five years | | 100 |
| Pu-241 | | 3,500 |
| Cm-242 | | 20,000 |
| Ra-226 | | 100 |

(iv) Classification determined by short-lived radionuclides. If the waste does not contain any of the radionuclides listed in clause (iii)(V) of this subparagraph, classification shall be determined based on the concentrations shown in subclause (VI) of this clause. However, as specified in clause (vi) of this subparagraph, if radioactive waste does not contain any nuclides listed in either clause (iii)(V) of this subparagraph or subclause (VI) of this clause, it is Class A.

(I) If the concentration does not exceed the value in Column 1 of subclause (VI) of this clause, the waste is Class A.

* To convert the Ci/m³ values to gigabecquerel (GBq) per cubic meter, multiply the Ci/m³ value by 37.

** To convert the nCi/g values to becquerel (Bq) per gram, multiply the nCi/g value by 37.

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(II) If the concentration exceeds the value in Column 1 of subclause (VI) of this clause but does not exceed the value in Column 2 of subclause (VI) of this clause, the waste is Class B.

(III) If the concentration exceeds the value in Column 2 of subclause (VI) of this clause but does not exceed the value in Column 3 of subclause (VI) of this clause, the waste is Class C.

(IV) If the concentration exceeds the value in Column 3 of subclause (VI) of this clause, the waste is not generally acceptable for near-surface disposal.

(V) For wastes containing mixtures of the radionuclides listed in subclause (VI) of this clause, the total concentration shall be determined by the sum of fractions rule described in clause (vii) of this subparagraph.

(VI) Classification table for short-lived radionuclides.

| Radionuclide | Concentration, curie/cubic meter* | | |
|--|-----------------------------------|----------|----------|
| | Column 1 | Column 2 | Column 3 |
| Total of all radionuclides with less than 5-year half-life | 700 | * | * |
| H-3 | 40 | * | * |
| Co-60 | 700 | * | * |
| Ni-63 | 3.5 | 70 | 700 |
| Ni-63 in activated metal | 35 | 700 | 7,000 |
| Sr-90 | 0.04 | 150 | 7,000 |
| Cs-137 | 1 | 44 | 4,600 |

* To convert the Ci/m³ value to gigabecquerel (Gbg) per cubic meter, multiply the Ci/m³ value by 37. There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other radionuclides in this table determine the waste to be Class C independent of these radionuclides.

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(v) Classification determined by both long- and short-lived radionuclides. If the radioactive waste contains a mixture of radionuclides, some of which are listed in clause (iii)(V) of this subparagraph and some of which are listed in clause (iv)(VI) of this subparagraph, classification shall be determined as follows:

(I) If the concentration of a radionuclide listed in clause (iii)(V) of this subparagraph is less than 0.1 times the value listed in clause (iii)(V) of this subparagraph, the class shall be that determined by the concentration of radionuclides listed in clause (iv)(VI) of this subparagraph.

(II) If the concentration of a radionuclide listed in clause (iii)(V) of this subparagraph exceeds 0.1 times the value listed in clause (iii)(V) of this subparagraph, but does not exceed the value listed in clause (iii)(V) of this subparagraph, the waste shall be Class C, provided the concentration of radionuclides listed in clause (iv)(VI) of this subparagraph does not exceed the value shown in Column 3 of clause (iv)(VI) of this subparagraph.

(vi) Classification of wastes with radionuclides other than those listed in clauses (iii)(V) and (iv)(VI) of this subparagraph. If the waste does not contain any radionuclides listed in either clauses (iii)(V) and (iv)(VI) of this subparagraph, it is Class A.

(vii) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each radionuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a concentration of 50 curies per cubic meter (Ci/m^3) (1.85 terabecquerels per cubic meter (TBq/m^3)) and Cs-137 in a concentration of 22 Ci/m^3 (814 gigabecquerels per cubic meter (GBq/m^3)). Since the concentrations both exceed the values in Column 1 of clause (iv)(VI) of this subparagraph, they must be compared to Column 2 values. For Sr-90 fraction, $50/150 = 0.33$, for Cs-137 fraction, $22/44 = 0.5$; the sum of the fractions = 0.83. Since the sum is less than 1.0, the waste is Class B.

(viii) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors, which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocurie (becquerel) per gram.

§289.202(ggg)(4)(B)

(B) Radioactive waste characteristics.

(i) The following are minimum requirements for all classes of waste and are intended to facilitate handling and provide protection of health and safety of personnel at the disposal site.

(I) Wastes shall be packaged in conformance with the conditions of the license issued to the site operator to which the waste will be shipped. Where the conditions of the site license are more restrictive than the provisions of this section, the site license conditions shall govern.

(II) Wastes shall not be packaged for disposal in cardboard or fiberboard boxes.

(III) Liquid waste shall be packaged in sufficient absorbent material to absorb twice the volume of the liquid.

(IV) Solid waste containing liquid shall contain as little free-standing and non-corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1.0% of the volume.

(V) Waste shall not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

(VI) Waste shall not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with subclause (VIII) of this clause.

(VII) Waste must not be pyrophoric. Pyrophoric materials contained in wastes shall be treated, prepared, and packaged to be nonflammable.

(VIII) Wastes in a gaseous form shall be packaged at an absolute pressure that does not exceed 1.5 atmospheres at 20 degrees Celsius. Total activity shall not exceed 100 Ci (3.7 terabecquerels (TBq)) per container.

(IX) Wastes containing hazardous, biological, pathogenic, or infectious material shall be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials.

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(ii) The following requirements are intended to provide stability of the waste. Stability is intended to ensure that the waste does not degrade and affect overall stability of the site through slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.

(I) Waste shall have structural stability. A structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and compaction equipment, the presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.

(II) Notwithstanding the provisions in clause (i)(III) and (IV) of this subparagraph, liquid wastes, or wastes containing liquid, shall be converted into a form that contains as little free-standing and non-corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1.0% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.

(III) Void spaces within the waste and between the waste and its package shall be reduced to the extent practicable.

(C) Labeling. Each package of waste shall be clearly labeled to identify whether it is Class A, Class B, or Class C waste, in accordance with subparagraph (A) of this paragraph.

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(5) Time requirements for record keeping.

| <u>Specific Section</u> | <u>Name of Record</u> | <u>Time Interval Required for Record Keeping</u> |
|---------------------------------------|--|--|
| subsection (ll)(4) of this section | Records at Additional Authorized Use/ Storage Sites | While site is authorized on license/registration |
| subsection (mm)(1)(A) of this section | Radiation Protection Programs | Until termination of license/ registration |
| subsection (mm)(1)(B) of this section | Program Audits | 3 years |
| subsection (nn)(1) of this section | Routine Surveys, Instrument Calibrations and Package Surveys | 3 years |
| subsection (nn)(2) of this section | Surveys, Measurements, Calculations Used for Dose Determination; Results of Air Sampling, Bioassays; Measurements, Calculations Used to Determine Release of Radioactive Effluents | Until termination of license/ registration |
| subsection (oo) of this section | Tests for leakage/ contamination of sealed sources | 5 years |
| subsection (pp) of this section | Lifetime Cumulative Occupational Radiation Dose, TRC Form 21-2 | Until termination of license |
| subsection (pp) of this section | Records Used to Prepare TRC Form 21-2 | 3 years |
| subsection (qq)(B) of this section | Planned Special Exposures | Until termination of license |

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Specific
Section

Name of Record

Time Interval Required
for Record Keeping

subsections (rr)(1-3)
of this section

Individual Monitoring
Results; TRC Form 21-3

Update annually;
Maintain until
termination of
license/
registration

subsection (rr)(5)
of this section

Records Used to Prepare
TRC Form 21-3

3 years

subsection (rr)(4)
of this section

Embryo/Fetus Dose

Until termination of
license/
registration

subsection (ss)
of this section

Dose to Individual Members
of the Public

Until termination of
license/
registration

subsection (tt)
of this section

Discharge, Treatment, or
Transfer for Disposal

Until termination of
license/
registration

subsection (uu)
of this section

Entry Control Device Testing
for Very High Radiation Areas

3 years

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(6) Acceptable surface contamination levels.

| NUCLIDE ^a | AVERAGE ^{bcf} | MAXIMUM ^{bdf} | REMOVABLE ^{bcef} |
|---|--|---|--|
| U-nat, U-235, U-238, and associated decay products except Ra-226, Th-230, Ac-227, and Pa-231 | 5,000 dpm alpha/ 100 cm ² | 15,000 dpm alpha/ 100 cm ² | 1,000 dpm alpha/ 100 cm ² |
| Transuranics, Ra-223, Ra-224, Ra-226, Ra-228, Th-nat, Th-228, Th-230, Th-232, U-232, Pa-231, Ac-227, Sr-90, I-129 | 1,000 dpm/100 cm ² | 3,000 dpm/100 cm ² | 200 dpm/100 cm ² |
| Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above. | 5,000 dpm beta, gamma/100 cm ² | 15,000 dpm beta, gamma/100 cm ² | 1,000 dpm beta, gamma/100 cm ² |

^a Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

^b As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^c Measurements of average contamination level should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each object.

^d The maximum contamination level applies to an area of not more than 100 cm².

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- ^e The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.
- ^f The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 centimeter and 1.0 mrad/hr at 1 centimeter, respectively, measured through not more than 7 mg/cm² of total absorber.

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§289.202(ggg)(7)

(7) Concentration and activity limits of nuclides for disposal in a Type I municipal solid waste site or a hazardous waste facility (for use in subsection (fff) of this section). The following table contains concentration and activity limits of nuclides for disposal in a Type I municipal solid waste site or a hazardous waste facility.

| Nuclides | Concentrations Limit (Ci/m ³) | Annual Generator Disposal Limit (Ci/yr) |
|----------|--|--|
| F-18 | 3×10^{-1} | 8 |
| Si-31 | $1 \times 10^{+2}$ | $3 \times 10^{+3}$ |
| Na-24 | 9×10^{-4} | 2×10^{-2} |
| P-32 | 2 | $5 \times 10^{+1}$ |
| P-33 | 10 | $3 \times 10^{+2}$ |
| S-35 | 9 | $2 \times 10^{+2}$ |
| Ar-41 | 3×10^{-1} | 8 |
| K-42 | 2×10^{-2} | 5×10^{-1} |
| Ca-45 | 4 | $1 \times 10^{+2}$ |
| Ca-47 | 2×10^{-2} | 5×10^{-1} |
| Sc-46 | 2×10^{-3} | 5×10^{-2} |
| Cr-51 | 6×10^{-1} | $2 \times 10^{+1}$ |
| Fe-59 | 5×10^{-3} | 1×10^{-1} |
| Co-57 | 6×10^{-2} | 2 |
| Co-58 | 1×10^{-2} | 3×10^{-1} |
| Zn-65 | 7×10^{-3} | 2×10^{-1} |
| Ga-67 | 3×10^{-1} | 8 |
| Se-75 | 5×10^{-2} | 1 |
| Br-82 | 2×10^{-3} | 5×10^{-2} |
| Rb-86 | 4×10^{-2} | 1 |
| Sr-85 | 2×10^{-2} | 5×10^{-1} |
| Sr-89 | 8 | $2 \times 10^{+2}$ |
| Y-90 | 4 | $1 \times 10^{+2}$ |
| Y-91 | 4×10^{-1} | 10 |
| Zr-95 | 8×10^{-3} | 2×10^{-1} |
| Nb-95 | 8×10^{-3} | 2×10^{-1} |
| Mo-99 | 5×10^{-2} | 1 |
| Tc-99m | 1 | $3 \times 10^{+1}$ |
| Rh-106 | 1 | $3 \times 10^{+1}$ |
| Ag-110m | 2×10^{-3} | 5×10^{-2} |
| Cd-115m | 2×10^{-1} | 5 |
| In-111 | 9×10^{-2} | 2 |

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| Nuclides | Concentrations Limit (Ci/m ³) | Annual Generator Disposal Limit (Ci/yr) |
|----------|--|--|
| In-113m | 9 | $2 \times 10^{+2}$ |
| Sn-113 | 6×10^{-2} | 2 |
| Sn-119 | $2 \times 10^{+1}$ | $5 \times 10^{+2}$ |
| Sb-124 | 2×10^{-3} | 5×10^{-2} |
| Te-129 | 2×10^{-1} | 5 |
| I-123 | 4×10^{-1} | $1 \times 10^{+1}$ |
| I-125 | 7×10^{-1} | $2 \times 10^{+1}$ |
| I-131 | 4×10^{-2} | 1 |
| I-133 | 2×10^{-2} | 5×10^{-1} |
| Xe-127 | 8×10^{-2} | 2 |
| Xe-133 | 1 | $3 \times 10^{+1}$ |
| Ba-140 | 2×10^{-3} | 5×10^{-2} |
| La-140 | 2×10^{-3} | 5×10^{-2} |
| Ce-141 | 4×10^{-1} | $1 \times 10^{+1}$ |
| Ce-144 | 1×10^{-3} | 3×10^{-2} |
| Pr-143 | 6 | $2 \times 10^{+2}$ |
| Nd-147 | 7×10^{-2} | 2 |
| Yb-169 | 6×10^{-2} | 2 |
| Ir-192 | 1×10^{-2} | 3×10^{-1} |
| Au-198 | 3×10^{-2} | 8×10^{-1} |
| Hg-197 | 8×10^{-1} | $2 \times 10^{+1}$ |
| Tl-201 | 4×10^{-1} | $1 \times 10^{+1}$ |
| Hg-203 | 1×10^{-1} | 3 |

NOTE: In any case where there is a mixture in waste of more than one radionuclide, the limiting values for purposes of this paragraph shall be determined as follows:

For each radionuclide in the mixture, calculate the ratio between the quantity present in the mixture and the limit established in this paragraph for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

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Examples: If radionuclides a, b, and c are present in concentrations C_a , C_b , and C_c , and if the applicable concentrations are CL_a , CL_b , and CL_c respectively, then the concentrations shall be limited so that the following relationship exists:

$$(C_a/CL_a) + (C_b/CL_b) + (C_c/CL_c) \leq 1$$

If the total curies for radionuclides a, b, and c are **represented** A_a , A_b , and A_c , and the annual curie limit for each radionuclide is AL_a , AL_b , and AL_c , then the generator is limited to the following:

$$(A_a/AL_a) + (A_b/AL_b) + (A_c/AL_c) \leq 1$$

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§289.202(ggg)(8)

(8) Soil contamination limits for selected radionuclides (for use in subsection (ddd) of this section).

| <u>Isotope</u> | <u>Concentration Limits* (pCi/g)</u> |
|-----------------|--|
| Americium-241 | 6 |
| Antimony-125 | 100 |
| Bismuth-207 | 60 |
| Cadmium-109 | 200 |
| Carbon-14 | 800 |
| Cesium-137 | 40 |
| Cobalt-60 | 300 |
| Europium-152 | 80 |
| Europium-154 | 20 |
| Europium-155 | 200 |
| Hydrogen-3 | 3,000 |
| Iodine-125 | 200 |
| Iodine-129 | 200 |
| Iodine-131 | 60 |
| Iridium-192 | 40 |
| Iron-55 | 2,000 |
| Nickel-63 | 700 |
| Plutonium-238 | 6 |
| Plutonium-239 | 6 |
| Plutonium-240 | 6 |
| Promethium-147 | 200 |
| Scandium-46 | 40 |
| Sodium-22 | 30 |
| Strontium-90 | 40 |
| Technetium-99 | 200 |
| Thallium-204 | 60 |
| Thorium-230 | 6 |
| Thorium-232 | 8 |
| Uranium-234 | 6 |
| Uranium-238 | 8 |
| Uranium-natural | 30 |

* It must be emphasized that every effort must be made to reduce contamination to background levels and that the limits in this table only apply when it is technically or economically impractical to do so.

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(9) Cumulative occupational exposure form. The following, **BRC Form 202-2**, is to be used to document cumulative occupational exposure history: (Please find **BRC Form 202-2** at the end of this section.)

(10) Occupational exposure form. The following, **BRC Form 202-3**, is to be used to document occupational exposure record for a monitoring period: (Please find **BRC Form 202-3** at the end of this section.)

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